PSYCHE.

LIFE HISTORY OF *PLEOTOMUS PALLENS* LEC.

BY HELEN SELINA KING, AUSTIN, TEXAS.

The habitat of this species of the subtribe *Lampyrini* is western Texas, where the mature form appears in May, a month later than several species of *Photinus*. Both sexes are phosphorescent, the ♂ feebly so, emitting a greenish light, without rays, but sufficiently bright to betray his presence; the ♀ is much more brilliant, her light being sufficient to show not only her body, but also surrounding objects for a distance of several centimetres. After oviposition this light declines, and the female, who seems to have assumed the perfect form for the purpose alone of laying eggs, soon dies. She does not feed, and is too helpless to move far from the place of her final metamorphosis, owing to the feeble support which her disproportioned body receives from her feet. When creeping, as she does by spasmodic efforts, she touches objects with her palpi, and moves her head from side to side. The eggs are deposited in one or more pits, which the female makes in the soft moist earth with her abdomen.

The eggs are smooth, round, pale yellowish, about the size of black mustard seed, and, as far as I am aware, not phosphorescent. In six weeks they produce young larvae 4 mm. long, cinereous on dorsum, dull white on venter, and emitting light from the ventral surface of the posterior segment. When fully grown, the larva, except that the color is different, and the body is less depressed, is precisely similar to that of the commonest species of *Photinus* larva found here, which is perfectly represented in figure 431 of Packard's "Guide to the Study of Insects." It has twelve segments exclusive of the head, which latter is composed of two flattened narrower segments, the inner one forming the neck, and both retractile within the thorax. It feeds on snails; and sheds its larval skin at least twice, possibly oftener, before reaching maturity. Under confinement in a pot of earth, with snails for food, it assumes the pupa state in about seven weeks, but it may attain its growth sooner when at large. Both the larval moults and the transformation to pupa are performed by the splitting of the membrane on the pleura through the first three segments, and its removal over the posterior end of the abdomen.

The shield of the ♂ pupa immediately after its liberation from the larval skin, seems to consist of two fused segments; the three following segments are narrow, and the middle one of these has a transverse depression suggesting the fusion of two

segments at that point. Following these are seven abdominal segments. The pectinate antennae and the wing cases are seen, and on the propygidium the phosphorescent vesicles are visible as clear greenish yellow spots. From the terminal segment are two straight processes. The pleural region, antennae, and feet distinguish this pupa from those of *Photinus*. The final metamorphosis takes place in six days.

The ♀ form assumed the pupa condition one week later than the ♂. It has two white tubercles or small processes on the sides of the wing-bearing segments, indicating the position of the future rudimentary elytra. The pleural region is different from that of the ♂, and the parts of the mouth are not sheathed separately as in the ♂, but are as it were muzzled. Antennae and eyes are not visible; the shield seems to consist of two fused segments, as seen through the thin membrane. There are seven abdominal segments. The whole body is of a salmon color. This pupa matures in six days and perfects as an apterous imago with rudimentary elytra.

Thus we find that under artificial management the eggs will mature sufficiently to hatch in five weeks, the larva requires about seven weeks to reach the pupa stage, and the latter lasts only six days, the ♂ in one instance accomplishing its cycle one week sooner than the ♀. In a few days after becoming perfect, the ♂ dies, and the ♀, after wandering a little, lays her eggs and dies also.

Pleotomus pallens ♂ is rare. Head covered by the prothorax. Eyes large, dark-purplish, contiguous. Labial palpi visible at tip. Maxillary palpi small. Mandibles not prominent, very small. Antennae short, approximate, 14-jointed, bipectinate, usually folded so as to seem unipectinate, situated in front of the eyes and parallel with anterior edge of the prothorax, their tips recurved, color fuscotestaceous. Prothorax finely punctulate, subhyaline, elevated at its base; its sides beneath embracing the neck and forming a collar for the head when the latter is protruded: it is broader than in the ordinary species of firefly, fuscotestaceous, with rosy centre in some, in others with transverse, irregular confluent pink spots on the posterior part; the flanks beneath this part are also pink. Elytra striate, elevated at their base, the concave humeral region embracing the sides of the abdomen, whence the elytra slope backward to a narrow dehiscent point, leaving nearly three segments visible. Wings same length as elytra, and smoke color. Feet feeble and compressed, same color as the body. Seven ventral segments short, the last one pointed and partly retracted within the penultimate, which is emarginate.

On the last abdominal ring there is a spot on the anterior, outer margin of dorsum and venter, seen in the day as of a deeper yellow than the surrounding parts. Through this at night comes the phosphorescence, not in flashes, but as two oval spots, equally evident above and below, but more feeble than in any other firefly known to me. The ♂ has the same quick spasmodic motion noticed in the ♀. He feeds sparingly on the common garden snail, probably on its slime, being, I should think, too feeble to be actively aggressive, though I have seen him cling to a snail shell with much persistency.

Pleotomus pallens ♀, though apparently

more abundant than the ♂, is yet comparatively rare. It is of a buff or salmon color, with eleven segments, pink on their posterior margins, and overlapping. Head narrow, with projecting muzzle, but imperfect organs of manducation. Eyes small, round, black, on sides of the head. Antennae shorter than thorax, approximate, situated in front of the eye, pale yellow, feebly pectinate. Thorax with margin reflexed, subrugose. Adjoining the shield are the rudimentary elytra, semicircular and very small. Feet feeble, compressed; the body is disproportionately large, and the insect consequently moves with sudden nervous action, and pauses every few steps.

Though there are no special phosphorescent vesicles visible through the membrane, yet it emits light from the entire ventral surface of the three posterior segments. This is very brilliant, and when less intense posteriorly, appears diffused over the body. This brilliancy continues until oviposition. This ♀ insect is similar to Packard's illustration 428, of an apterous ♀ from Madagascar, plus the aborted elytra and pectinate antennae.

NOTE ON NORTH AMERICAN *TRYPETIDAE*.

BY CHARLES ROBERT OSTEN SACKEN, HEIDELBERG, GERMANY.

Among a number of diptera, collected by Mr. J. Boll in Dallas, Texas, and purchased by me in Geneva a short time ago, there were 25 ♂ and ♀ specimens of a *Trypeta*, bearing on a label "bred from galls on *Ambrosia*." The insect could be easily identified with *T. gibba* Loew, and as the habits of this species were hitherto unknown, I deem it worth the while to put Mr. Boll's observation on record.

The gall, which is likewise in the collection, is an oblong swelling of the stem, probably terminal.

The habits of the following North American *Trypeta* have been hitherto investigated and published (the name of the discoverer is in parentheses) : —

Rhagoletis pomonella. — Fruit of the apple-tree (Walsh).
Oedaspis polita. — Gall on *Solidago* (O. S.).
" *gibba.* — Gall on *Ambrosia* (Boll).
Eurosta solidaginis. — Gall on *Solidago* (Harris).
Eutreta diana. — Gall on *Artemisia tridentata* (Riley).
Aspilota alba. — Seeds of *Vernonia* (Riley).

This is a very small number, in comparison to that of the described N. A. *Trypeta*; but the most striking circumstance in connection with it is that among six *Trypeta*, whose habits are known, not less than *four* should occur in galls, and only *one* in the heads of a composite flower. In Europe the *Trypeta* bred from galls form an imperceptible minority, and most of the species are obtained from the heads of composites. Compare, for instance, the list of 60 species bred by Frauenfeld (Verh. k.-k. zool.-bot. Gesell. Wien, 1863, p. 221–224), among which only *three* formed galls on the stem of the plant.

It would be worth while for American entomologists to collect dry heads of composite plants in autumn, for the purpose of breeding *Trypeta*; a large number of new species of these pretty flies would probably be obtained.

September, 1879.